

### **ABSTRACT OF THE DISCLOSURE**

The present invention, by coating the polymer electrolyte membranes for fuel cells with inorganic thin films via a PECVD method or a reactive sputtering method, reduces the methanol crossover sizably without seriously reducing the ionic conductivity of polymer electrolyte membranes, thereby, when applied to fuel cells, realizes a high performance of fuel cells. A surface of membrane can be coated with inorganic thin films made of inorganic materials, which are for example silicone oxide, titanium oxide, etc., so as to make composite polymer electrolyte membrane. For coating, plasma enhanced chemical vapor deposition method or reactive method can be used.